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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/749,451

12/31/2003

Michael D. Grah

D-43584-01

9833

7590

05/18/2006

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P.O. Box 464
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EXAMINER

BUTLER, PATRICK

ART UNIT

PAPER NUMBER

1732

DATE MAILED: 05/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/749,451	GRAH, MICHAEL D.	
	Examiner	Art Unit	
	Patrick Butler	1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 and 34-59 is/are pending in the application.
- 4a) Of the above claim(s) 17,25,26,35 and 39-59 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16,18-24,27-32,34 and 36-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

The Applicant's Amendments and Accompanying Remarks, filed 13 March 2006, have been entered and have been carefully considered. No Claims are new, Claim 1 is amended, Claim 33 is canceled, and Claims 1-16, 18-24, 27-32, and 34 are pending.

Despite these advances, the invention as currently claimed is not found to be patentable for reasons herein below.

The Text of those sections of Title 35, US Code not included in this action can be found in a prior Office Action.

Inventorship

In view of the papers filed 13 March 2006, it has been found that this nonprovisional application, as filed, through error and without deceptive intent, improperly set forth the inventorship, and accordingly, this application has been corrected in compliance with 37 CFR 1.48(a). Adding Marvin R. Havens has changed the inventorship of this application.

The application will be forwarded to the Office of Initial Patent Examination (OIPE) for issuance of a corrected filing receipt, and correction of Office records to reflect the inventorship as corrected.

Terminal Disclaimer

The terminal disclaimer filed on 13 March 2006 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of

any patent granted on Application Number 10/275,209 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Information Disclosure Statement

The information disclosure statement filed 13 March 2006 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. Specifically, Document Number 0 308 106 A2/A3 has not been provided, and pages 39-45 of "Calculation of the electronic structure of carbon films using electron energy loss spectroscopy" have not been provided.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claim 1 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 8 of copending Application No. 10/142,044. Although the conflicting claims are not identical, they are not patentably distinct from each other because they both claim a method of providing a film with semiconducting fullerenes (carbon nanotubes), shrink the film, and exposing the film to radiation. Copending claims 35 and 37 provide the radiation necessary (100 mJ/cm² and 1,000 mW/cm²) necessary to structurally disrupt the carbon nanotubes.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim 1 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 14 of copending Application No. 11/208,464. Although the conflicting claims are not identical, they are not patentably distinct from each other because they both claim a method of providing a film with carbon nanotubes and polyester (thermoplastic polymer) and exposing the film to radiation energy. Copending claims 7 and 9 provide the radiation necessary (500 mW/cm² and 10 kGy) necessary to structurally disrupt the carbon nanotubes.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

Claims 1-16, 18-24, 27-32, and 36 are rejected under 35 U.S.C. 102(e) as being anticipated by Grah et al (2004/0241482).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

With respect to Claims 1-5, Grah discloses using various thermoplastics with SWCNM [0011]. Multiple shrink characteristics are taught with respect to shrinkage percentage and pressure [0111,0113]. Radiation is taught, which would induce the shrinkage [0138].

With respect to Claims 6 and 7, irradiation is taught, which would limit shrinkage ability [0114].

With respect to Claims 8-12 and 20-23, irradiation is taught [0138] with given amounts, which would necessarily be a function of various quantities based on intensity and duration, as samples are given [0140].

With respect to Claims 13-16, the content of SWCNT in each layer and the polymer content of ethylene (polyolefin) and vinyl acetate (vinyl plastic) are taught polymers to use [0011, 0029].

With respect to Claim 18, an example of three layers is given [0058].

With respect to Claim 19, thickness variation, including greater than 1 mil is given [0026].

With respect to Claims 24 and 27, energetic radiation treatments are taught, which includes visible light [0138] without limiting the duration or applications.

With respect to Claims 28-32, various quantities of SWCNM are taught which read on the claims [0041].

With respect to Claim 36, there is not teaching of creating perforations.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-12, 13-16, 18-24, 27, 32, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noel et al. (US Patent No. 6,355,287) in view of Dupire (US Patent No. 6,331,265) and Dunn (US Patent No. 4,871,559).

With respect to Claims 1, 2, and 3 Noel teaches using a film made of a thermoplastic polymer with a free shrink of 15-60 percent using ASTM D 2732 (providing a film comprising one or more polymers wherein the film has a free shrink at 185°F in at least one of the machine or transverse directions of at least 5% [Claim 1]/20% [Claim 2]/40% [Claim 3] measured according to ASTM D 2732) and using radiation to seal the film, which shrinks to the meat (exposing the film to an amount of

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radiation energy effective to activate the shrink characteristic of the film) (see col. 1, lines 58-62; col. 2, lines 46-49; col. 5, lines 55-58; col. 7, lines 53-60).

Noel does not explicitly teach adding at least about 0.001 weight percent of single-walled carbon nanotube material based on the weight of the film.

Dupire teaches adding carbon nanotubes into a polymer mixture reinforces the polymer (see Abstract). Dupire teaches that single-wall and multi-wall carbon nanotubes are both known to be used. The quantity of the quantity of carbon nanotubes added to a given quantity of polymer is not particularly limited (at least about 0.001 weight percent of single-walled carbon nanotube material based on the weight of the film) (see col. 4, lines 32-43).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Dupire's single wall carbon nanotubes in Noel's package's film, particularly the shrinking seal layer, in order to reinforce the polymer film's seal layer (see Dupire Abstract), which would further the goal of preventing the failure of the shrink film as described by Noel (see col. 1, lines 13-54) since reinforcing the seal layer necessarily reinforces the seal.

Noel teaches heat-treating using radiation, but does not explicitly teach non-ionizing radiation, but the teaching does direct those of ordinary skill in the art to use any heating treatment (see col. 5, lines 51-63).

Dunn teaches application of radiation to films with food inside (see col. 6, lines 18-32). Dunn teaches that the treatment may exclude UV portions, thus leaving the balance of the radiation (applying non-ionizing radiation) (see col. 9, lines 58-66). Dunn

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teaches that radiation can be applied at a dose of 0.01 to 50 J/cm^2 from 0.001 to 100 milliseconds (see col. 8, lines 33-53).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Dunn's non-ionizing radiation, dose, and duration in the method taught by Noel and Dupire because in accordance with Dunn's treatment, food products may be preserved in respect to microbial and/or enzymatic degrading processes, providing significant shelf-life and stability enhancements (see Dunn col. 4, lines 18-33) and because it obviates the complexities of additional safety precautions associated with ionized radiation in a production environment.

Given the application of average light power needed to structurally disrupt is present— $10,000 \text{ mW/cm}^2$ (using a value from the ranges of dose and duration provided by Dunn as previously described, 1 J/cm^2 delivered during 100 milliseconds is $(1,000 \text{ mJ})/(0.1 \text{ sec.} * \text{cm}^2) = 10,000 \text{ mJ/sec/cm}^2 = 10,000 \text{ mW/cm}^2$), the carbon nanotubes would necessarily be structurally disrupted.

With respect to Claims 4 and 5, Dupire teaches that the shrink tension of the film is 50 to 350 p.s.i. according to ASTM 2838 (a shrink tension at 185°F of at least 100 p.s.i. [Claim 4]; at most 250 p.s.i. [Claim 5]) (see col. 2, lines 41-56).

With respect to Claims 6 and 7, Dupire teaches that the shrinking is done via application of radiation heating (see col. 5, lines 51-62) and that heat setting reduces the free shrink slightly, substantially, or completely (the exposing step; decrease by at least 10%)(see col. 8, lines 9-11). Therefore, the heating process also reduces the shrink characteristic. Moreover, Dupire clarifies the relationship between shrinking and

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tension is based on either being unrestrained or restrained during the shrinking activity of the film (free shrink [Claim 6], shrink tension [Claim 7]) (see col. 7, lines 41-52).

With respect to Claim 8 and 9, Dunn teaches application of radiation to films with food inside (see col. 6, lines 18-32). Dunn teaches that the treatment may exclude UV portions, thus leaving the balance of the radiation (applying non-ionizing radiation) (see col. 9, lines 58-66). Dunn teaches that radiation can be applied at a dose of 0.01 to 50 J/cm² (at least about 0.01 mJ/cm² [Claim 8]/ 1 mJ/cm² [Claim 9]) from 0.001 to 100 milliseconds (at most 30 seconds [Claim 8]/ 10 seconds [Claim 9]) (see col. 8, lines 33-53).

With respect to Claims 10, 11, and 12, using a value from the ranges of dose and duration provided by Dunn as previously described, 1 J/cm² delivered during 100 milliseconds is $(1,000 \text{ mJ}) / (0.1 \text{ sec.} * \text{cm}^2) = 10,000 \text{ mJ/sec/cm}^2 = 10,000 \text{ mW/cm}^2$ (a radiation intensity of at least about 10 mW [Claim 10]/50 mW [Claim 11]/ 500 mW [Claim 12] per cm²).

With respect to Claim 13 and 14, the incorporation of Dupire's single wall carbon nanotubes into the shrinking seal layer of Noel's packaging film, as previously described, necessarily puts the SWCNM in one layer (at least one layer [Claim 13]/a shrink layer [Claim 14] comprising about 50% of the single-walled carbon nanotube material by weight of the total amount of single walled carbon nanotube material in the film) (see col. 4, lines 32-43).

With respect to Claims 15 and 16, Noel teaches that the seal layer is polyolefin or polyvinyl chloride and can be 3 mils. The film in whole can be 3 mils. Allowing for

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slightly less than 3 mils to accommodate the additional 2 layers, and with the carbon nanotube material being optionally minimal in content, the polyolefin would necessarily be > 50% in the film weight (at least 50% of one or more polyolefins [Claim 15]/vinyl plastic [Claim 16] by weight of the film) (see Noel col. 2, lines 41-56; col. 3, lines 4-9; col. 5, lines 19-34).

With respect to Claim 18, the film has 3 layers (col. 5, lines 19-25).

With respect to Claim 19, the film can be 1.8 mils (at least about 1 mil in thickness) (see col. 2, lines 41-49).

With respect to Claim 20-23, Dunn teaches that radiation can be applied from 0.001 to 100 milliseconds (at most 30 seconds [Claim 20]/ 10 seconds [Claim 21]/ 1 second [Claim 22]/ 0.01 seconds [Claim 23]) (see col. 8, lines 33-53).

With respect to Claim 24, Dunn teaches that visible light is effective, therefore its 100% use would constitute the at least about 50% of the radiant energy (see col. 9, lines 58-66). Moreover, considering an instance of radiation as shown in Fig. 14 and that UV may be filtered as taught by Dunn, the higher energy of the visible light portion (400-700 nm) than the IR (700-1000 nm) constitutes additional examples of visible light teachings that would constitute using radiation comprising at least about 50% visible light energy.

With respect to Claim 27, Dun teaches about 1-50 pulses of light (discontinuously by at least two pulses)(see col. 10, lines 38-49).

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With respect to Claims 28-32, the polymer composition taught by Dupire to make a layer is taught to be less than 50% (at least about 0.01 weight % [Claim 28]/ 0.1% [Claim 29]/ 0.5% [Claim 30]/ 1% [Claim 31]/ 5% [Claim 32] (see col. 4, lines 33-43).

With respect to Claim 34, given the application of average light power needed to structurally disrupt is present—10,000 mW/cm² (using a value from the ranges of dose and duration provided by Dunn as previously described, 1 J/cm² delivered during 100 milliseconds is $(1,000 \text{ mJ}) / (0.1 \text{ sec.} * \text{cm}^2) = 10,000 \text{ mJ/sec/cm}^2 = 10,000 \text{ mW/cm}^2$), the carbon nanotubes would necessarily be structurally disrupted.

With respect to Claim 36, none of the three references teach that radiation as applied causes perforations, nor are they required.

Claims 37 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noel et al. (US Patent No. 6,355,287) in view of Dupire (US Patent No. 6,331,265) and Dunn (US Patent No. 4,871,559) as applied to Claim 1 above, and further in view of Havens (US Patent No. 5,110,530).

With respect to Claims 37 and 38, Noel in view of Dupire and Dunn teach making a film with SWCNM in the shrinkable seal layer as previously described, but they do not teach teaches more layers and making a striped layer in the film.

Havens teaches making a striped film of ethyl vinyl acetate by putting in a striped layer that is supported by the outer layer 16 and an inner layer 14 (discontinuous region supported by the outer layer; discontinuous regions comprise thermoplastic polymer [Claim 38]) (see col. 2, lines 5-17).

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Dupire's nanotubes in a striped layer as taught by Havens in the film as taught by Noel in order to help identify the signature of the manufacturer via the distinctiveness of the packaging (see Havens abstract).

Response to Arguments

Applicant's arguments filed 13 March 2006 have been fully considered but they are not persuasive.

Applicant argues with respect to the Double Patenting rejections. Applicant's arguments appear to be on the grounds that:

1) The ODP rejection over application 10/452,892 is improper, as the referenced subject matter is not claimed.

2) A Terminal Disclaimer has been filed to obviate ODP rejection over 10/725,709.

Applicant argues with respect to the 102(e) rejections. Applicant's arguments appear to be on the grounds that:

3) The affidavit under CFR 1.132 filed 13 March 2006 overcomes the 102(e) rejection over application number 10/452,892.

4) The rejection over 10/725,209 is not by another, given the Mr. Havens's addition to the Inventorship of 10/745,451.

Applicant argues with respect to the 103 rejections. Applicant's arguments appear to be on the grounds that:

5) The rejection using Noel and Dupire fails to teach structurally disrupting SWCN material.

6) The rejection using Noel, Dupire, and Dunn fails to teach structurally disrupting SWCN material.

7) Dunn does not seal the films of Noel using pulsed light.

8) Noel, Dupire, Owensby, and Ushirogouchi fail to teach structurally disrupting the SWCN material.

9) There is not teaching to incorporate SWCN in discontinuous regions of a film.

The Applicant's arguments are addressed as follows:

1) Applicant's arguments with respect to the ODP rejection over application 10/452,892 have been fully considered and are persuasive, and the ODP rejection over application 10/452,892 has been withdrawn.

2) In view of the Terminal Disclaimer of application number, 10/725,209 ODP rejection has been withdrawn.

3) The affidavit under 37 CFR 1.132 filed 13 March 2006 is insufficient to overcome the rejection of claims 1-16, 18-24, 27-32, and 36 based upon the rejection under 35 U.S.C. 102(e) as being anticipated by Grah et al (2004/0241482) as set forth in the last Office action because: Taken at face value, the inventive entity S.

Specifically, Havens is not an applicant for 10/452,892. Therefore, the reference (application number 10/452,892) is not by S and another, since it lacks all members of S. See MPEP 715.01(a).

4) Applicant's arguments with respect to the 102(e) rejection over application number 10/725,209 have been fully considered and are persuasive, and the 102(e) rejection over application 10/725,209 has been withdrawn.

5) Applicant's arguments with respect to the rejection using Noel and Dupire have been considered but are moot in view of the new ground(s) of rejection.

6) Applicant's arguments with respect to the rejection using Noel, Dupire, and Dunn have been considered but are moot in view of the modified ground(s) of rejection as detailed in the 103 rejection above.

7) Dunn is not combined in order to seal the films of Noel using pulsed light. The motivation is a treatment used so that food products may be preserved in respect to microbial and/or enzymatic degrading processes, providing significant shelf-life and stability enhancements (see Dunn col. 4, lines 18-33) and because it obviates the complexities of additional safety precautions associated with ionized radiation in a production environment.

To clarify, Dunn's light is being used to as treatment in addition to Noel's treatment.

8) Applicant's arguments with respect to the rejection using Noel, Dupire, Owensby, and Ushirogouchi have been considered but are moot in view of the new ground(s) of rejection.

9) The motivation is to help identify the signature of the manufacturer via the distinctiveness of the packaging.


Conclusion

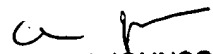
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick Butler whose telephone number is (571) 272-8517. The examiner can normally be reached on Mon.-Thu. 7:30 a.m. - 5 p.m. and alternating Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Colaianni can be reached on (571) 272-1196. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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CHRISTINA JOHNSON
PRIMARY EXAMINER
5/15/06